



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/895,198	07/02/2001	K. Paul Muller	YO999-247DIV	1509
29154	7590	02/04/2009	EXAMINER	
FREDERICK W. GIBB, III Gibb Intellectual Property Law Firm, LLC 2568-A RIVA ROAD SUITE 304 ANNAPOLIS, MD 21401			TRINH, HOA B	
			ART UNIT	PAPER NUMBER
			2893	
			MAIL DATE	DELIVERY MODE
			02/04/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/895,198	MULLER ET AL.	
	Examiner	Art Unit	
	HOA B. TRINH	2893	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 02 January 2009.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 30-44 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 30-44 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____. | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/02/2009 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claim 30-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rostoker (5,662,768; reference of record cited on 04/12/2002).

As to claim 30, Rostoker discloses an IC structure comprising a substrate 4 (fig. 1f) having an upper surface, wherein said substrate 4 comprises a substrate material 4; an opening (trench, fig. 1f) in the substrate 4 defined by said substrate material 4, wherein borders of the substrate material form a first rectangular portion originating with an intersection of said upper surface and said opening and a second rectangular portion, wherein the first rectangular portion has a larger dimensions in a horizontal direction than the second and third rectangular portions, wherein said horizontal direction is between sidewalls of said first rectangular portion and said second rectangular portion, and wherein said sidewalls are perpendicular to said upper surface; and a conductor 32 (figs. 1f, 3) filling the opening (trench, figs. 1f, 3). See marked-up figure 1f below.

With respect to the comparative rectangular portions and their respective dimensions of the first, second and third rectangular portions, it is well known in the semiconductor art to size and configure different structures in the device. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rostoker with the dimensions of the first, second, and third portions, as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, a change in thickness, size, or shape without a

significant function is not inventive to discover the optimum or workable range by routine experimentation. See In re Aller, 220 F.2d 454, 105 USPQ 233,235 (CCPA 1955).

As to claims 31, 41, the second rectangular is deeper in the opening (trench; fig. 1f) than the first rectangular portion (fig. 1f). See marked-up figure 1f below.

As to claims 32, 42, the first rectangular portion is deeper than the second rectangular portion. See marked-up figure 1f below.

As to claims 33, 43, the second rectangular portion increases a surface area of said opening (trench). See marked-up figure 1f below.

As to claims 34, 44, the second rectangular portion inherently increases a capacitance of the structure. See marked-up figure 1f below.

As to claim 35, Rostoker discloses an IC structure comprising a substrate 4 (fig. 1f) having an upper surface, wherein said substrate 4 comprises a substrate material 4; an opening (trench, fig. 1f) in the substrate 4 defined by said substrate material 4, wherein borders of the substrate material form a first rectangular portion originating with an intersection of said upper surface and said opening, a second rectangular portion and a third rectangular portion, wherein the first rectangular portion has a larger dimensions in a horizontal direction than the second and third rectangular portions, wherein said horizontal direction is between sidewalls of said first rectangular portion, second and said third rectangular portion, and wherein said sidewalls are perpendicular to said upper surface; and a conductor 32 (figs. 1f, 3) filling the opening (trench, figs. 1f, 3). See marked-up figure 1f below.

With respect to the comparative rectangular portions and their respective dimensions of the first, second and third rectangular portions, it is well known in the semiconductor art to size and configure different structures in the device. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rostoker with the dimensions of the first, second, and third portions, as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, a change in thickness, size, or shape without a significant function is not inventive to discover the optimum or workable range by routine experimentation. See In re Aller, 220 F.2d 454, 105 USPQ 233,235 (CCPA 1955).

As to claim 36, said second rectangular portion is between said first rectangular portion and said third rectangular portion. See marked-up figure 1f below.

As to claim 37, said first rectangular portion and said third rectangular portion have substantially similar dimensions. See marked-up figure 1f below.

As to claim 38, said second rectangular portion increases increase a surface area of said structure. See marked-up figure 1f below.

As to claim 39, the first rectangular portion and the third rectangular portion have different dimensions (fig. 1f) in said horizontal direction. See marked-up figure 1f below.

As to claim 40, Rostoker discloses an IC structure comprising a substrate 4 (fig. 1f) having an upper surface, wherein said substrate 4 comprises a substrate material 4; a bottled shaped opening (trench, fig. 1f) in the substrate 4 defined by said substrate

material 4, wherein borders of the substrate material form a first rectangular portion located completely below and having no portion thereof coincident with said upper surface, and a second rectangular portion located below said first rectangular portion and bounded on two sides by a mask material deposited on said substrate material, wherein the first rectangular portion has a larger dimensions in a horizontal direction than the second and third rectangular portions, wherein said horizontal direction is between sidewalls of said first rectangular portion and said second rectangular portion, and wherein said sidewalls are perpendicular to said upper surface; and a conductor 32 (figs. 1f, 3) filling the opening (trench, figs. 1f, 3). See marked-up figure 1f below.

With respect to the comparative rectangular portions and their respective dimensions of the first, second and third rectangular portions, it is well known in the semiconductor art to size and configure different structures in the device. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Rostoker with the dimensions of the first, second, and third portions, as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, a change in thickness, size, or shape without a significant function is not inventive to discover the optimum or workable range by routine experimentation. See In re Aller, 220 F.2d 454, 105 USPQ 233,235 (CCPA 1955).

U.S. Patent

Sep. 2, 1997

Sheet 2 of 4

5,662,768

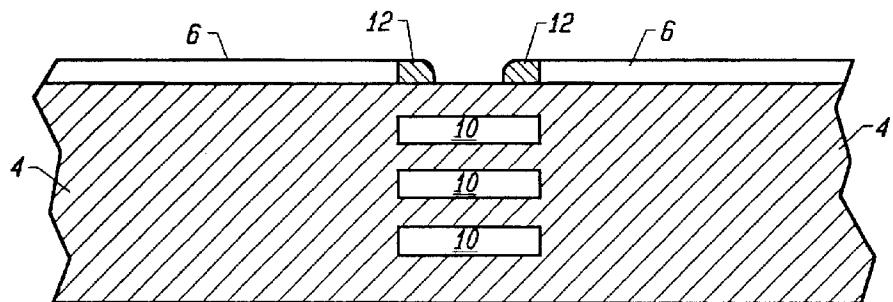


FIG. 1d

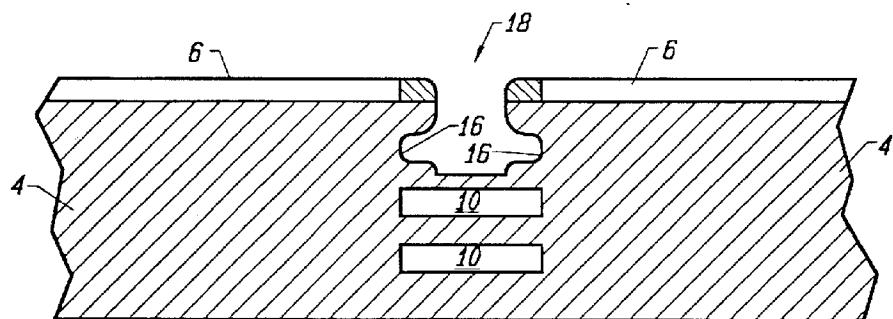


FIG. 1e

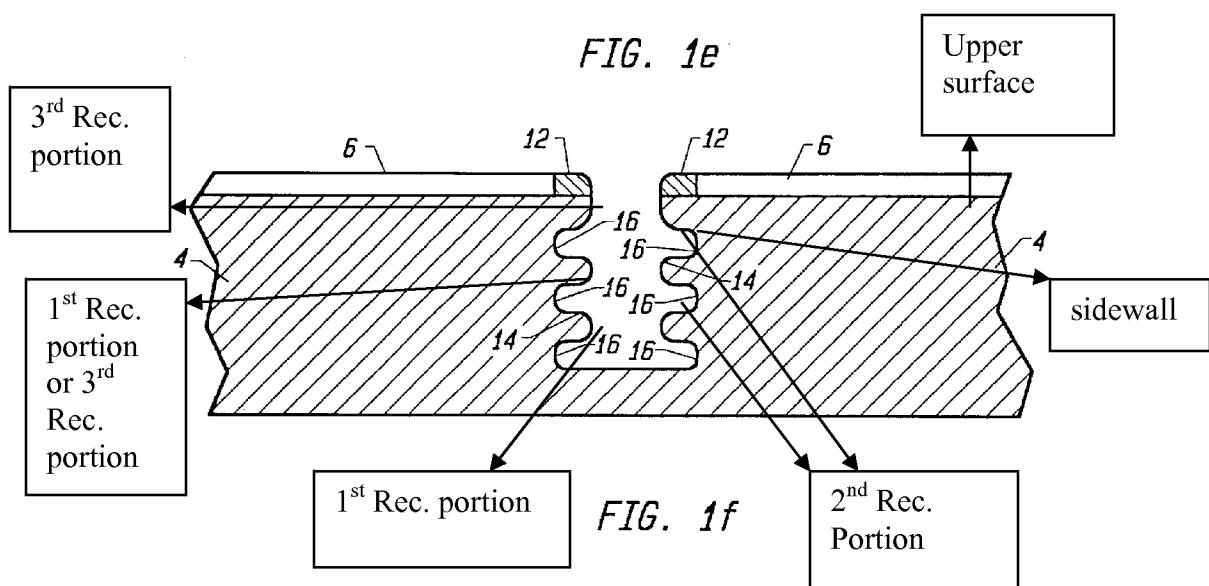


FIG. 1f

Response to Arguments

1. Applicant's arguments with respect to the newly amended pending claims 30-44 have been considered but they are not persuasive.
 - a. Objection of the specification is moot in view of the newly amended claim 30.
 - b. Rejection of claims 30-44: In the remarks, applicants contend that Rostoker does not disclose all of the limitation as claimed. However, the examiner disagrees with applicant's allegation of Rostoker. As stated in the above rejection, Rostoker discloses all of the limitations in claims. Rostoker discloses an IC structure comprising a substrate 4 (fig. 1f) having an upper surface, wherein said substrate 4 comprises a substrate material 4; an opening (trench, fig. 1f) in the substrate 4 defined by said substrate material 4, wherein borders of the substrate material form a first rectangular portion originating with an intersection of said upper surface and said opening and a second rectangular portion, wherein the first rectangular portion has a larger dimensions in a horizontal direction than the second and third rectangular portions, wherein said horizontal direction is between sidewalls of said first rectangular portion and said second rectangular portion, and wherein said sidewalls are perpendicular to said upper surface; and a conductor 32 (figs. 1f, 3) filling the opening (trench, figs. 1f, 3). Further, it is noted that regarding to the rectangular portions and the dimensions, it has been held that where the general conditions of the claims are disclosed in the prior art, a change in thickness, size, or shape without a significant function is not inventive to discover the optimum or workable range by routine experimentation. See In re Aller, 220 F.2d 454, 105 USPQ 233,235 (CCPA 1955).

c. Therefore, it is still proper to apply Rostoker to the newly amended claims 30-40.

Conclusion

d. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to (Vikki) Hoa B. Trinh whose telephone number is (571) 272-1719. The Examiner can normally be reached from Monday-Friday, 9:00 AM - 5:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Ms. Davienne Monbleau, can be reached at (571) 272-1945. The office fax number is 571-273-8300.

e. Any request for information regarding to the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Also, status information for published applications may be obtained from either Private PAIR or Public Pair. In addition, status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. If you have questions pertaining to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

f. Lastly, paper copies of cited U.S. patents and U.S. patent application publications have ceased to be mailed to applicants with Office actions since June 2004. Paper copies of foreign patents and non-patent literature will continue to be included with office actions. These cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site (www.uspto.gov), from the Office of Public Records and from commercial sources. Applicants are referred to the

Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197 for information on this policy.

Requests to restart a period for response due to a missing U.S. patent or patent application publications will not be granted.

/(Vikki) Hoa B Trinh/

Examiner, Art Unit 2893